MANTIS: Implementation

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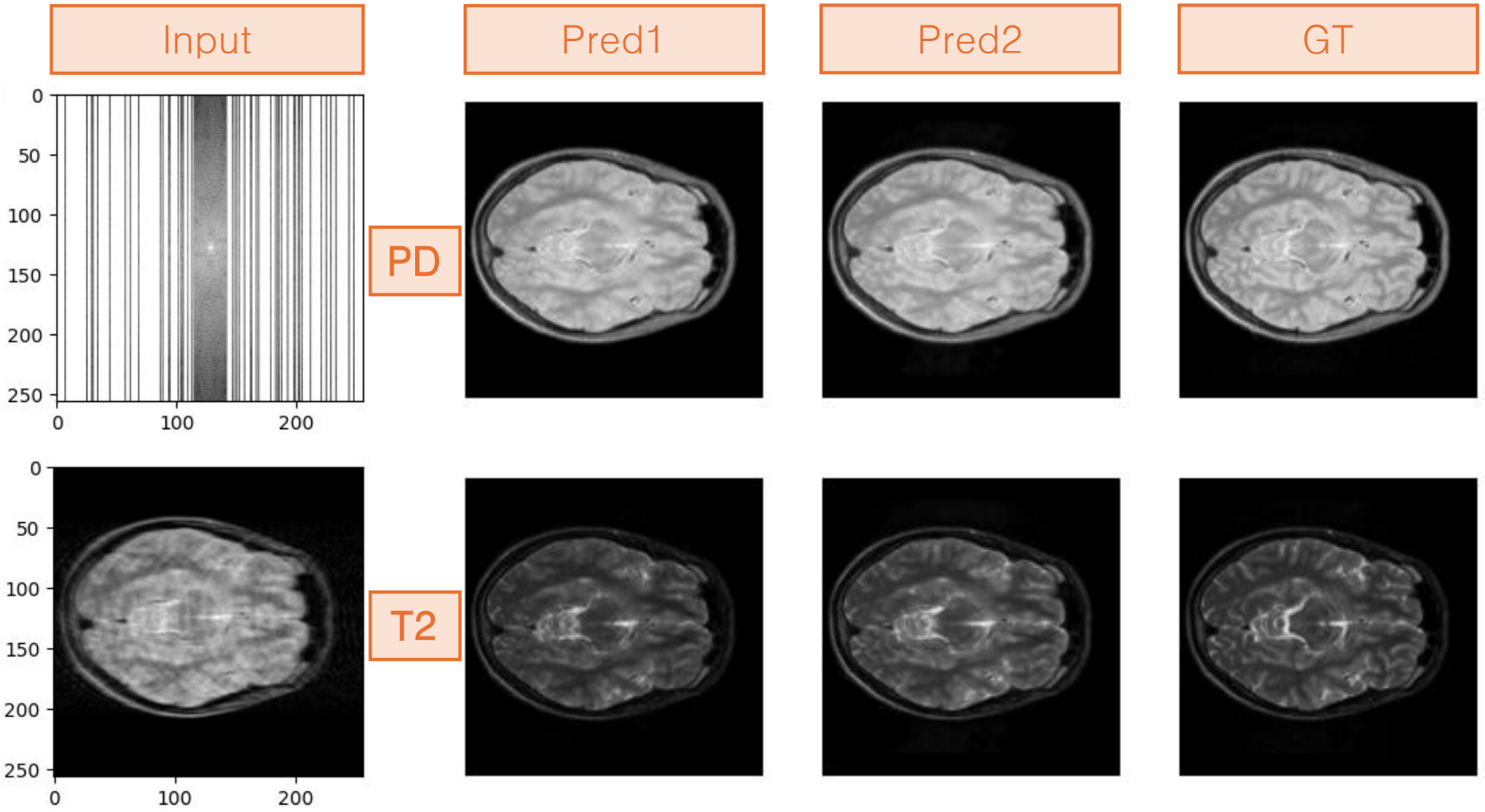
Results

$$R_{under} = 3, \lambda_{data} = 0.1, \lambda_{cnn} = 1.0, LR = 0.0002$$

$$(Case1 \rightarrow Case2: Masking\ improved)$$

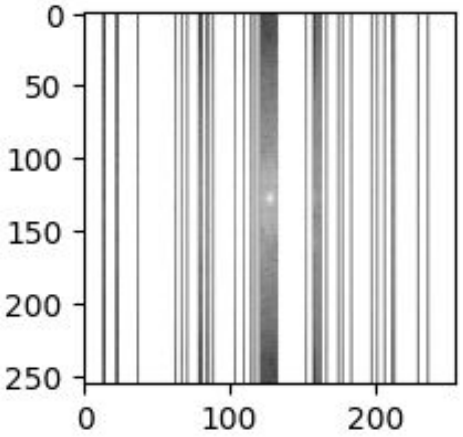
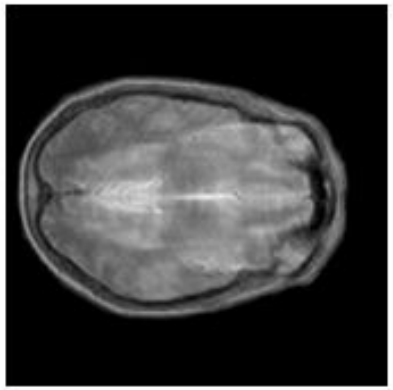
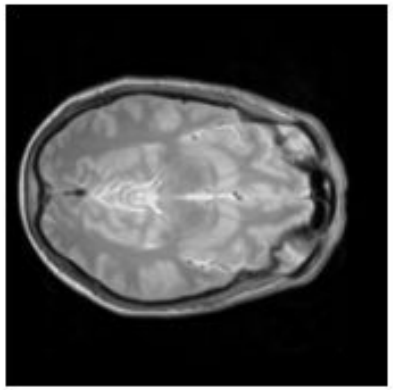
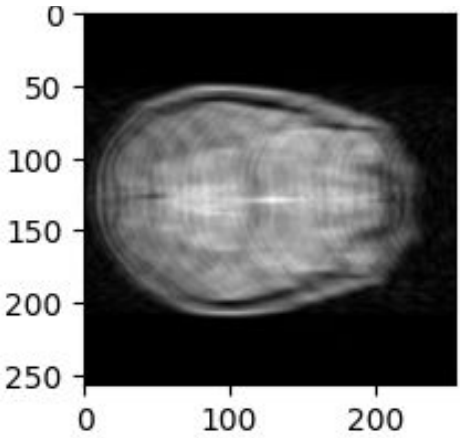
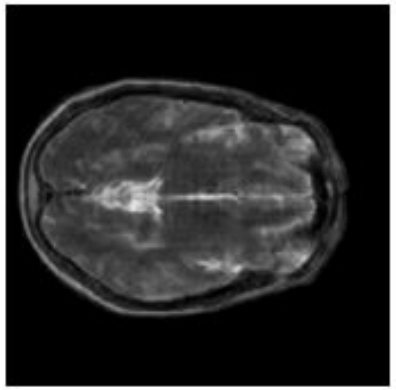
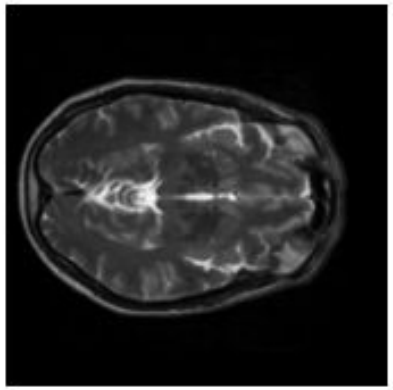


SSIM(%)	
Pred1	Pred2
86.03	89.46
nRMSE(%)	
Pred1	Pred2
2.47	2.18

SSIM(%)	
Pred1	Pred2
83.74	86.24
nRMSE(%)	
Pred1	Pred2
3.62	3.52

Results

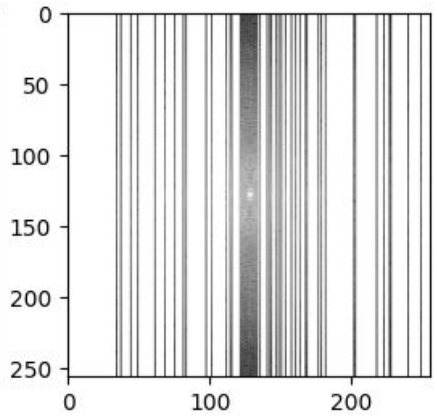
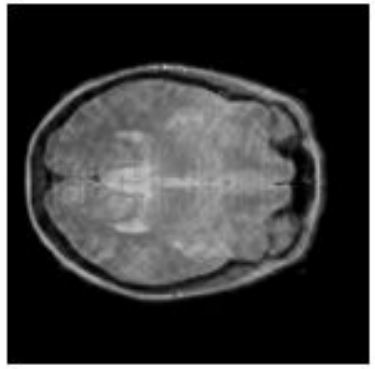
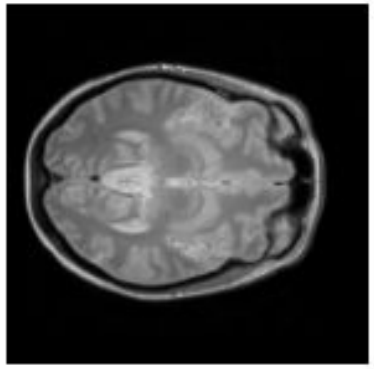
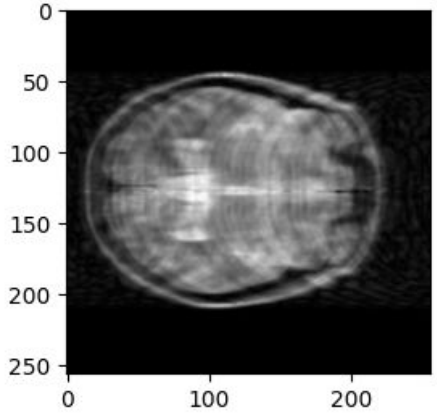
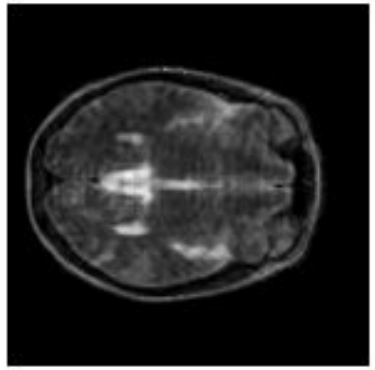
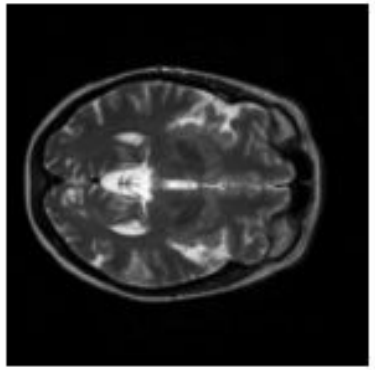
$$R_{under} = 5, \lambda_{data} = 0.2, \lambda_{cnn} = 1.0, LR = 0.0005$$

Input	Pred	GT	
			PD
			T2

SSIM(%)	nRMSE(%)
81.38	5.97
74.89	6.20

Results

$$R_{under} = 5, \lambda_{data} = 0.2, \lambda_{cnn} = 1.0, LR = 0.0006, gamm = 0.95$$

Input		Pred	GT
	PD		
	T2		

SSIM(%)
80.67
nRMSE(%)
3.71

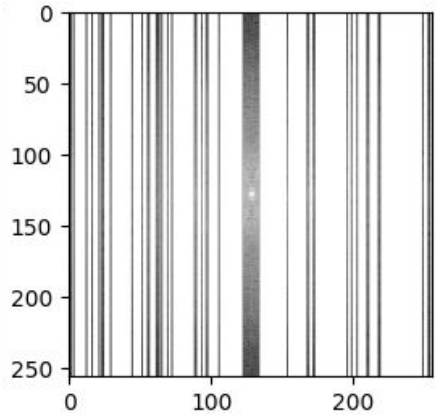
SSIM(%)
77.91
nRMSE(%)
4.85

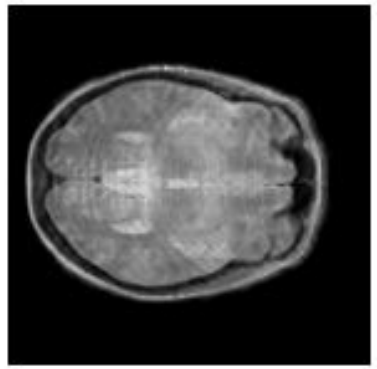
Results

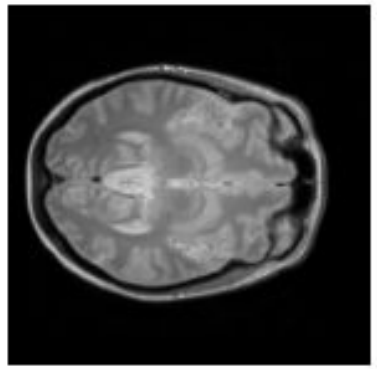
$$R_{under} = 5, \lambda_{data} = 0.3, \lambda_{cnn} = 1.0, LR = 0.0005, gamm = 0.95$$

Input	Pred	GT

PD

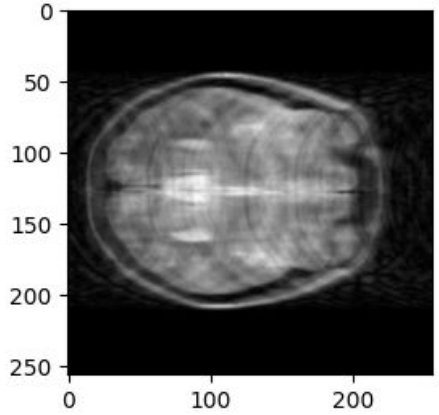


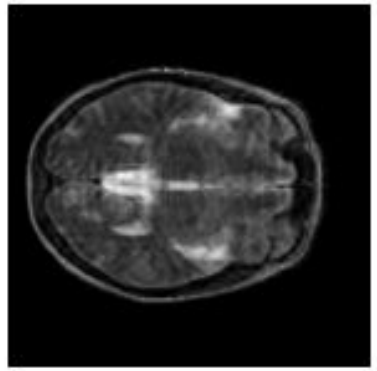


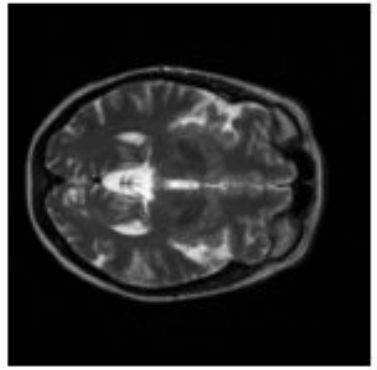


SSIM(%)
79.51
nRMSE(%)
4.50

T2



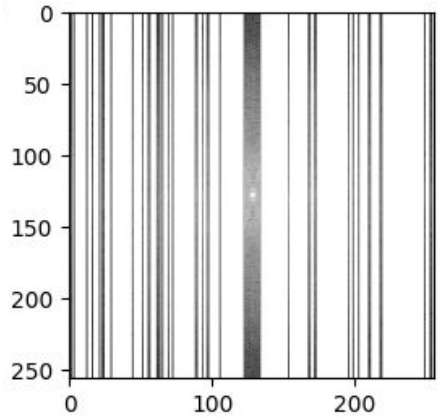
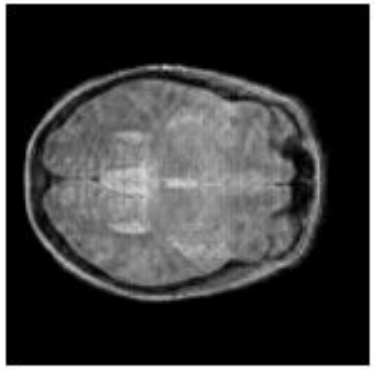
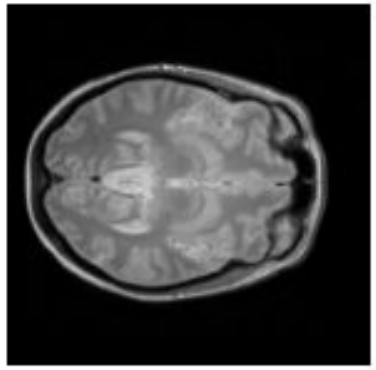
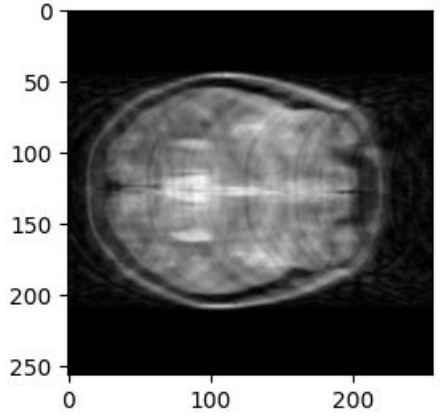
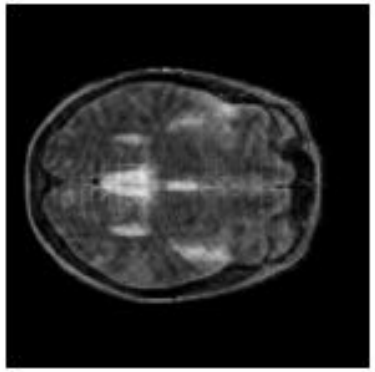
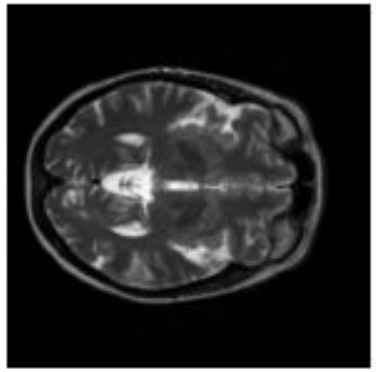




SSIM(%)
76.59
nRMSE(%)
5.40

Results

$$R_{under} = 5, \lambda_{data} = 0.5, \lambda_{cnn} = 1.0, LR = 0.0003, gamm = 0.9$$

Input		Pred	GT
	PD		
	T2		

SSIM(%)
72.61
nRMSE(%)
6.81

SSIM(%)
72.25
nRMSE(%)
6.16

Ours vs. MANTIS

TABLE 1 nRMSE and SSIM between the reference T_2 maps estimated from the fully sampled images and the reconstructed T_2 maps estimated using undersampling patterns

	Mean ± SD at R = 5		Mean ± SD at R = 8	
Methods	**nRMSE (%)**	**SSIM (%)**	**nRMSE (%)**	**SSIM (%)**
GLR	13.5 ± 4.3	72.5 ± 3.7	15.0 ± 3.9	63.2 ± 4.5
LLR	12.2 ± 3.5	70.4 ± 3.1	13.9 ± 3.5	59.2 ± 3.3
k-t SLR	9.8 ± 2.4	77.5 ± 3.3	11.6 ± 2.9	70.5 ± 3.6
ALOHA	8.9 ± 2.1	80.3 ± 3.5	10.9 ± 2.7	72.6 ± 3.8
U-Net Imaging + T2 Fitting	6.5 ± 2.0	83.5 ± 3.1	8.8 ± 2.9	76.2 ± 3.2
U-Net Mapping	6.9 ± 1.8	82.3 ± 2.8	8.5 ± 2.5	78.0 ± 2.5
MANTIS	**6.1 ± 1.5**	**86.2 ± 1.9**	**7.1 ± 1.8**	**82.1 ± 2.3**

Results were averaged over the 10 test patient data sets and represent mean value ± SD. MANTIS achieved the highest reconstruction performance with the smallest errors at both R = 5 and 8.

	Ours	MANTIS
SSIM(%)	**74.9**	**86.2**
nRMSE(%)	**6.2**	**6.1**